MOBILE ELEVATING HUT

[0001] The mobile elevating hut product **10** comprises a trailer, a platform, legs connecting the trailer to the platform, and a lifter to move the platform to and from a raised position. The platform in the raised position is freestanding and fully supported by the legs, so that energy from the lifter is not required to maintain the platform in the raised position.

[0002] The trailer enables the product to be transported to remote locations. The platform can be moved, sequentially and repeatably, to and from the raised position to facilitate transporting the product to different locations.

[0003] By supporting the platform with the legs rather than the lifter, the product in the raised position is structurally simplified and the safety and reliability of the product is enhanced. The platform can rest in the raised position for long periods with less chance of mechanical failure, power failure, and transient external loads on the platform causing unexpected and accidental lowering of the platform.

[0004] With the platform in the raised position, the product can provide a stable, elevated lookout perch. The product can be used for various purposes, such as to spot wildlife for photography and hunting, as a secure shelter, and as a work platform.

[0005] The product provides progress over the prior art shown for example in U.S. Pat. Nos. 228,647 by KING; 261,874 by RICH; 445,487 by ARNOLD; 2,600,807 by RIESER; 3,406,784 by JONES; 3,82,964 by SCHELLENBERG; 3,882,964 by SCHELLENBERG; 4,442,919 BY FULCHER; 4,719,716 by CHRISLEY; 5,295,555 by STRANGE; 5,564,523 by HOWARD; and 6,347,684 by FATH.

[0006] **FIG. 1** is a perspective view of an embodiment of the product with the platform in an intermediate position.

[0007] **FIG. 2** is a side view of the embodiment of **FIG. 1** showing the platform in a lowered position.

[0008] **FIG. 3** is a side view of the embodiment of **FIG. 1** showing the platform in a raised position.

[0009] The product comprises a trailer so that the product can be moved to remote and other locations. At a location, the product can be leveled to accommodate uneven terrain. The platform can be moved to a raised position to provide enhanced views of the surroundings, to isolate the platform from the surroundings, and to provide an elevated site for work, recreation, and other purposes.

[0010] The platform can be moved from the raised position to a different position, such as a position facilitating moving the product to a different location.

[0011] The trailer has a frame **31**. The trailer can have a hitch **32** at one end for connecting to a tow vehicle.

[0012] Trailer mobility can be provided by wheels, such as a wheel **33,** and by various other means such as runners, skis, tracks, and combinations of these and other means.

[0013] The trailer can have various leveling components, such as a screw jack **34**, for leveling the trailer on uneven ground. Alternatively, the leveling components can be scissors jacks, hydraulic jacks, various levers and wedges, and combinations thereof, so long as they provide the leveling function required to level the trailer. The leveling components can be collapsible, retractable, and removable for stowing during transport.

[0014] The platform can have various configurations such as a simple flat surface, a sheltered surface, a work area, and an enclosed hut with a floor, walls, windows, and doors. As seen in **FIG. 1**, the platform can include an enclosed hut **21** and an external walkway **27**.

[0015] The product can have means for accessing the platform. In the embodiment shown in **FIG. 1**, the means for accessing the platform is a two-section ladder. The upper ladder section **22** is fixed to the platform. The lower ladder section **25** is fixed to and rotates with a front leg **11**A. As the platform approaches the raised position, the ladder sections converge to form a continuous ladder assembly for accessing the platform.

[0016] Alternatively, the means for accessing the platform can be a lift, a climbing rope, stairs, a ramp, and other means and combinations thereof.

[0017] The product has legs pivotally connecting the trailer and the platform. In the embodiment shown in **FIG.1**, the legs comprise a first front leg **11A** pivotally connected to a first platform point **24A** and a first trailer point **37A**, a second front leg **11B** pivotally connected to a second platform point (not visible) and a second trailer point **37B**, a first rear leg **11C** pivotally connected to a third platform point **24C** and a third trailer point **37C**, and a second rear leg **11D** pivotally connected to a fourth platform point **24D** and a fourth trailer point (not visible.) The platform points and the trailer points can be on elements connected to the platform and to the trailer.

[0018] The product can have various numbers of legs, such as two, three, four, and more legs. Different leg configurations can be used, such as legs placed centrally between the front and rear sides of the platform, legs placed asymmetrically, and various other configurations.

[0019] The product has a lifter, in use acting between the trailer and the platform. The lifter provides energy for moving the platform with respect to the trailer.

[0020] The platform requires energy for moving the platform to the raised position. The energy for moving the platform to the raised position is hereinafter referred to as raising energy.

[0021] The platform requires energy for moving the platform away from the raised position. The energy for moving the platform away from the raised position is hereinafter referred to as lowering energy.

[0022] The lifter in use provides the raising energy for moving the platform to the raised position.

[0023] The raised position is the position where the platform is freestanding and fully supported by the legs without support from the lifter. In the raised position, the platform has no tendency to move away from the raised position and requires lowering energy to move to another position.

[0024] The lowering energy for moving the platform away from the raised position can be provided by the lifter. The lowering energy can be provided by other sources such as wind loads, movement on the platform, accidental impact on the trailer, and other transient events.

[0025] The raised position where the platform is freestanding and fully supported by the legs is an essential feature of the product. In addition, the lifter must be able to sequentially move the platform to the raised position and then move the platform away from the raised position, as required for setting up the product at different locations.

[0026] In the embodiment shown in **FIG. 1**, the lifter is a bi-directional winch comprising a drum **51**, a cable **53**, and a handle **56**. Various lifters, such as winches, worm gears, hydraulic and electric motors, hydraulic and pneumatic cylinders, and other devices can be utilized if they meet the operational requirements of providing raising energy and lowering energy.

[0027] The lifter in use must be able to provide raising energy to move the platform to the raised position. The lifter in use must be able to provide lowering energy to move the platform away from the raised position.

[0028] The lifter can be connected between various elements of the product such as the legs, the trailer, and the platform. Different lifters can require dissimilar mounting positions in order to move the platform. For instance, a worm gear lifter that provides torque to move the platform can require a different mounting position than a winch that provides a force, via a cable, to move the platform.

[0029] In the embodiment shown in **FIG. 1**, the winch is mounted between mounting plates, such as the mounting plate **52**. A cable **53** is wrapped around the winch drum **51** and both cable ends extend over the upper cable rod **54**. One end of the cable attaches directly to the anchor point **23** on the platform. The other end extends around the lower cable rod **55** and then attaches to the anchor point.

[0030] When the winch drum is rotated the cable wraps around the drum at one end and simultaneously unwraps from the drum at the other end. This arrangement enables the winch, via the cable, to lift the platform in either direction.

[0031] The winch can have more than one cable providing raising and lowering energy for moving the platform.

[0032] The trailer can have an upright. The upright in use is upstanding from the trailer. The upright can provide a mounting position for the lifter and a connection point for locking the platform in place. The trailer can have more than one upright.

[0033] In **FIG. 1**, there are two uprights, placed on either side and to the rear of the trailer. The upright has a perpendicular member **35** and a diagonal member **36**. Each upright shown in **FIG. 1** provides a mounting position for a winch mounting plate, such as the winch mounting plate **52**. Each upright shown in **FIG. 1** supports the upper cable rod **54**. Each upright can provide a locking hole **72** for locking a rear leg in place when the platform is in the raised position.

[0034] The upright can be foldable, collapsible, and removable to facilitate stowing during transport. The upright can be located in various positions, such as the front,

the rear, centered, and asymmetric positions on the trailer. The upright can have various configurations, such as an A-frame and a single member upright.

[0035] The product can have a lock, in use locking the platform in a position, such as the raised position. In the embodiment shown in **FIG. 3**, the lock comprises a pin **73**, inserted into a hole **71** through a rear leg and the hole **72** through the upright. The holes are shown in **FIG. 1**. When the platform is in the raised position, the holes align and the pin is inserted through the holes to lock the platform in the raised position. Various other locks and locking features can be used.

[0036] The lock can be comprised of the integral features of the platform, legs, and trailer. The lock can be comprised of standard parts such as bolts, padlocks, and hasps, specially designed parts, and combinations thereof.

[0037] In the embodiment shown **FIG. 2**, the platform is shown in the lowered position. The lowered position can be a stable position for towing due to the lowered center of gravity. The platform can be locked to the trailer in the lowered position to facilitate towing.

[0038] In the embodiment shown in **FIG. 1**, the platform is shown in an intermediate position between the lowered and raised positions. In an intermediate position, the platform position is inherently unstable and requires energy acting against the force of gravity to hold the platform in the intermediate position. In the embodiment shown in **Fig. 1**, the lifter, in this case the winch provides the energy to hold the platform in the intermediate position.

[0039] In **FIG. 3**, the platform is shown in the raised position. In the embodiment shown in **FIG.** 3, the platform in the raised position is freestanding and fully supported by the legs. The platform has no tendency to move away from the raised position. When the platform is in the raised position, the gravity vector **62**, shown passing through the platform center of gravity **61**, is balanced by upward forces through the legs.

[0040] With the platform in the raised position the legs can be substantially vertical, as shown in **FIG. 3**. Alternatively, the legs can be nonvertical when the platform is in the raised position. Alternatively, some legs can be vertical and some legs can be nonvertical when the platform is in the raised position.

[0041] In the raised position, the legs fully support the weight of the platform. Each downward-directed weight force of the platform, transmitted to the legs through the connection points on the platform, is balanced by an equal, upward-directed reaction force transmitted from the legs through the connection points on the trailer.

[0042] Since all the forces are balanced, the platform in the raised position is freestanding and the platform has no tendency to move from the raised position. Lowering energy is required to move the platform to another position. The lowering energy can be provided by the lifter and it can be provided by wind loads, movement on the platform, accidental impact on the trailer, and other transient events.

[0043] The first platform point **24A**, the first trailer point **37A**, the third platform point **24C**, and the third trailer point **37C** are the four vertices of a closed figure. The closed figure can be a parallelogram. Alternatively, the closed figure can be a trapezoid with two parallel sides. Alternatively, the closed figure can have no parallel sides.

[0044] When the closed figure is not a parallelogram, the legs and pivot points can be configured so that the platform travels past a potential energy peak as it moves to the raised position at a lower potential energy position. In this case, the raised position is a meta-stable position wherein the platform tends to return to the raised position if it is displaced a small amount from the raised position.

[0045] The meta-stable raised position is more resistant the effects of shifting wind loads and the movements of people and objects on the platform. In the meta-stable raised position, the lifter provides sufficient lowering energy for the platform to

overcome the potential energy peak, in order to move the platform away from the raised position.